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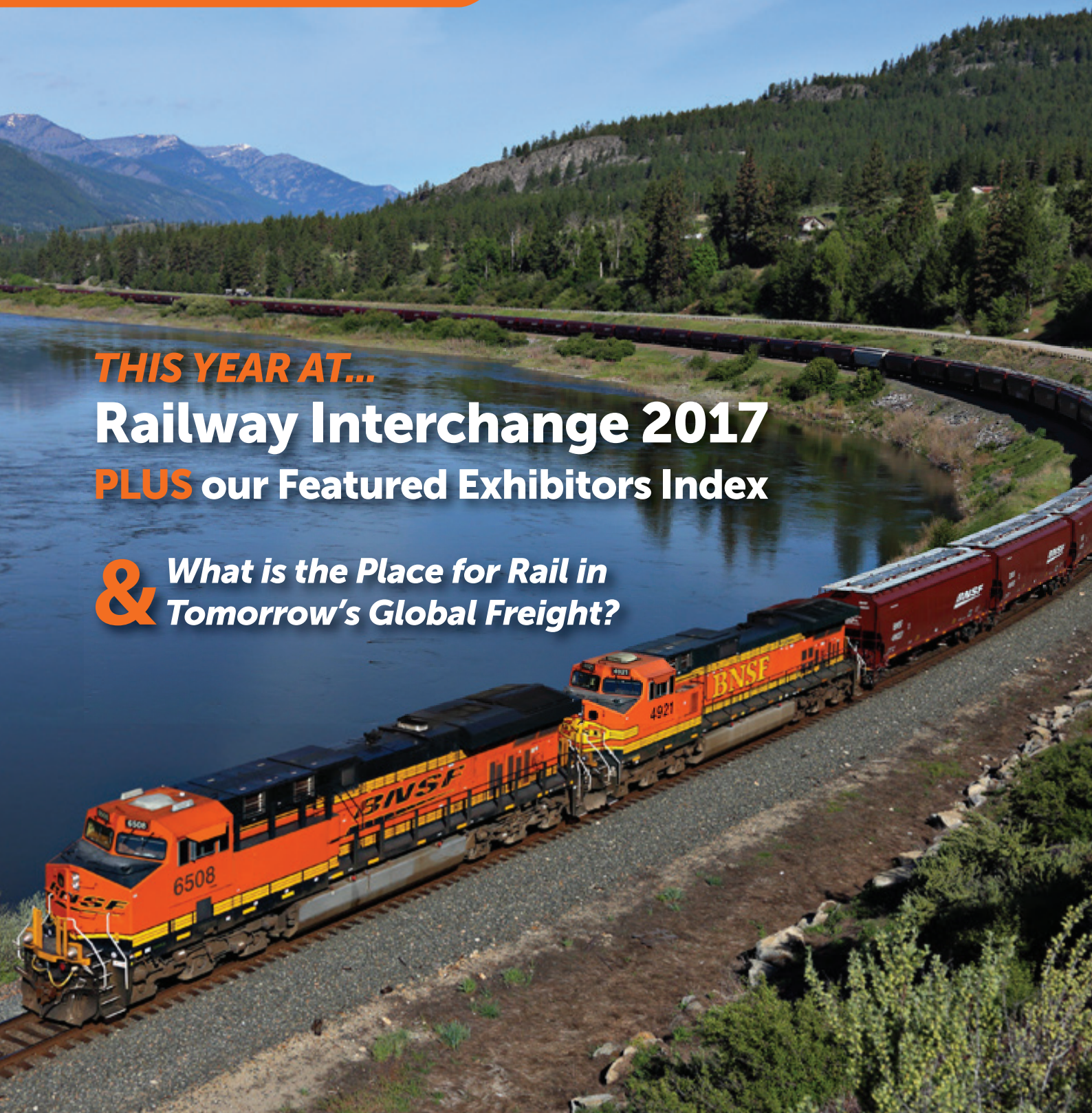
The latest news & reviews from the industry

**THIS YEAR AT...**

## **Railway Interchange 2017**

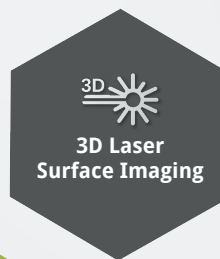
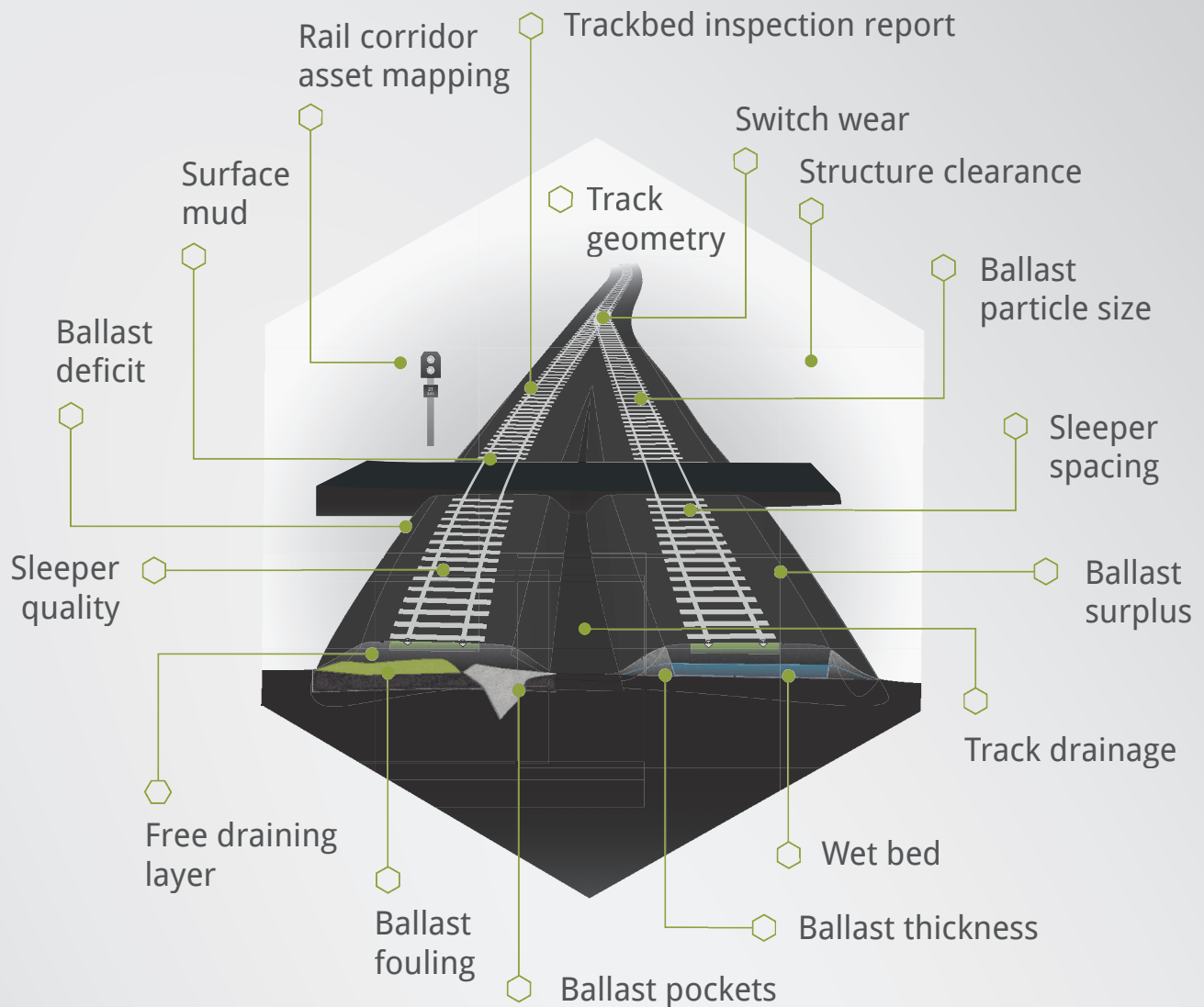
**PLUS** our Featured Exhibitors Index

**& What is the Place for Rail in  
Tomorrow's Global Freight?**



**RAILWAY INTERCHANGE – ISSUE FOUR 2017**







# Letter from the Editor

In this end-of-summer issue we've hopped across the pond, to cover **Railway Interchange 2017**, which takes place in the Indiana Convention Center in Indianapolis 17–20 September.

For complete details about the show, you can visit their website at **[www.railwayinterchange.org](http://www.railwayinterchange.org)**.

Please enjoy our write up of the show's exhibition and events along with our must see exhibitors' index.

Our feature article in this issue is 'What is the Place for Rail in Tomorrow's Global Freight?' by Yves Perret, DB Engineering & Consulting GmbH. He takes a look at the rail freight situation in the US, the EU and in Asia, examining the powerful influence of China on the market and India's response. A hugely interesting read.

We also have a contribution about the use of drones in rail – The Future of Rail Surveying – by Plowman Craven, examining how high-accuracy drone surveys look set to change the way rail track data is captured. The importance of using data to improve services, efficiency, maintenance and the like has absolutely been recognized in rail. The use of drones are just one of the many valuable applications here.

Another area where data and video analytics can help is in suicide prevention. I spoke with Lucas Young from Axis Communications about how network video can support suicide prevention on the rail network. It is of course only a small part of all the components that need to go into preventing suicides, not just on the rail network but in society as a whole; however, what a worthwhile use of such technology!

Our next issue, due to be published in

October, will focus on the Railway Interiors Expo held in Prague 14–15 November. The show will cover all aspects of interiors, from seating, catering solutions, lighting technologies, lavatories and washroom systems, anti-vandalism technologies, flooring solutions, safety equipment, infotainment systems and much more! If you are going and would like to be represented in our magazine, please contact Andrew Lush at [al@railway-news.com](mailto:al@railway-news.com).

If you are attending Railway Interchange 2017 or you've been to Railway Interiors Expo in the past, we'd love to hear from you about your show experiences. What did you like the most? What shows are you planning to attend next year? If you would like to feature your company experience in our magazine, please email me at [jcs@railway-news.com](mailto:jcs@railway-news.com).

Please enjoy our 4th issue of 2017!



  
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If you would like to submit editorial content, or you are interested in giving an interview for the magazine, please contact **Josephine Cordero Sapién**.

If you would like your company to join Railway-News's online platform, please contact **Andrew Lush**.

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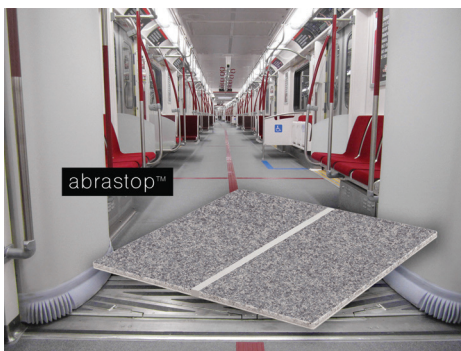
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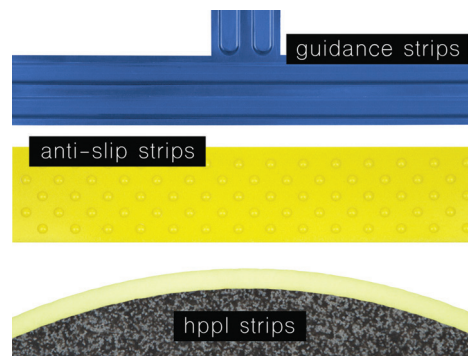
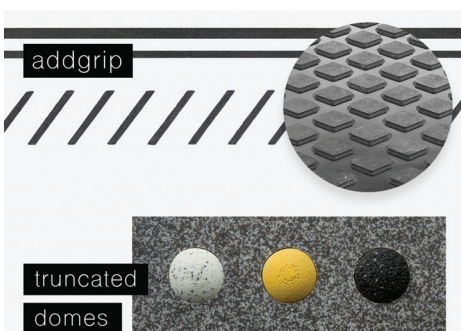
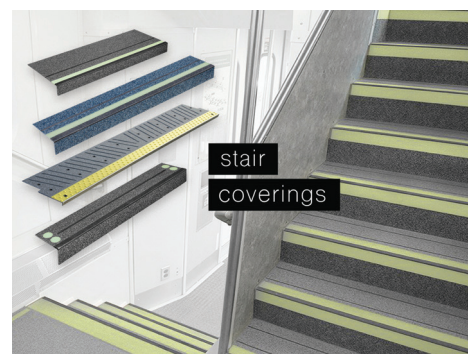
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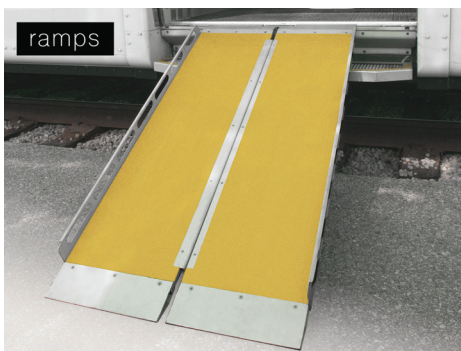
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## FOR TRAINS AND STATIONS



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Yves Perret from Deutsche Bahn takes stock of the global freight market and examines how China is influencing the rest of the world.

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Plowman Craven are involved in using drones as a quicker, safer, less disruptive method in rail surveying. In this article they present the many benefits and opportunities.

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Suicides are always distressing; for those contemplating it, it's the last resort, for loved ones, witnesses and first responders it's a traumatic and deeply shocking experience. What can be done in the rail industry to reduce the number of victims?

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September 2017 – November 2017



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The new technology of the APT1500RL offered by Plasser American is the first flash-butt welding machine that can weld rails fully automatically without manual interaction. Thanks to the integrated capability of the APT1500RL to perform automatic closure welds, a separate rail pulling device is not needed. Main features of the new rail welding robot are: fully automatic alignment of the running edge and top of the rail, pulsation welding to achieve a high-quality weld in shorter time and with less burn-off as well as automatic evaluation and documentation of the weld.

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# This Year at Railway Interchange 2017

- 17–20 September 2017
- Indiana Convention Center, 100 S. Capitol Avenue, Indianapolis, IN, United States





Railway Interchange is the 'largest combined railway exhibition and technical conference in North America' and takes place in a major city in the US every two years.

In 2015, 42 countries were represented at the show, with 88% of them from the US. The show featured 687 exhibits – 652 inside and 35 outside – and had 9,571 registered visitors.

## Exhibitors

Once again there are more than 600 exhibitors expected in 2017 who will be divided into three halls, depending on the categories the exhibitors' products and services fit into.

The blue halls (halls G–H), overseen by the Railway Supply Institute (RSI), the trade association for the rail supply industry, is for industry members working in the following areas:

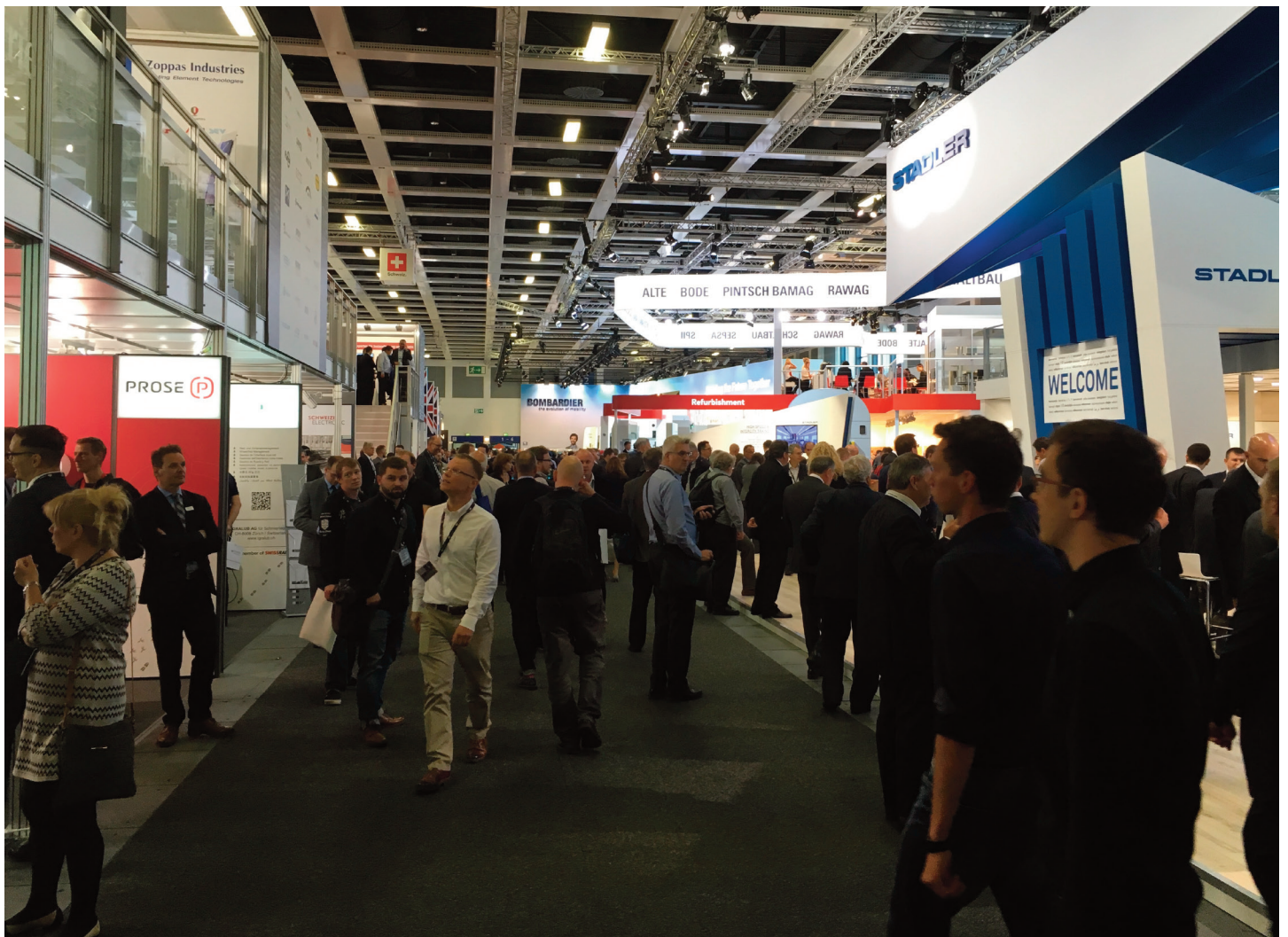
- **Locomotive and freight car manufacturers**
- **Tank car manufacturers**
- **Mechanical systems and component suppliers**
- **Railway measurement and maintenance systems**
- **Rolling stock leasing services etc.**

The red halls (halls I–K), overseen by the Railway Engineering-

Maintenance Suppliers Association (REMSA), which represents companies and individuals working in manufacturing and / or selling of maintenance-of-way equipment, is for these categories:

- **Track safety and inspection**
- **Track and rail maintenance**
- **Track machinery and tools**
- **Track structure components and supplies**
- **Non-track-bound products and services etc.**

The green halls (halls D–F), overseen by Railway Systems Suppliers Inc. (RSSI), a trade association involved in the







signalling and communications segment of the rail industry, is for suppliers who fit into these categories:

- **Communication systems**
- **Signal systems**
- **Information technology**
- **Crossing components and systems**
- **Wayside information systems**
- **Power switches**

## Education

During the show there will also be an education programme, provided by AREMA, the American Railway Engineering and Maintenance-of-way Association, and by CMAs, Co-ordinated Mechanical Associations. In addition to committee meetings running 16–21 September, AREMA will host a full programme throughout the show, with keynote speeches, five educational seminars and 80

technical presentations on a wide range of topics such as communications & signals, engineering and passenger & transit. The full schedule is available on the website and through the show's app (see below). AREMA are also kindly offering a spouse/guest programme, featuring a historical walking tour of Indianapolis for example.

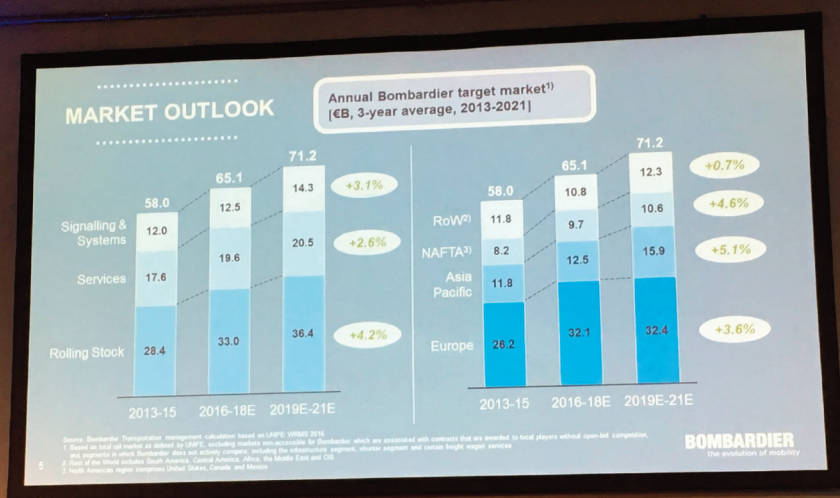
The CMAs with event programmes for Railway Interchange 2017 are:

- **Air Brake Association (ABA) – Rooms 131 and 132**
- **International Association of Railway Operating Officers (IAROO) – Rooms 131 and 132**
- **Mechanical Association of Railcar Technical Services (MARTS) – Room 133**
- **League of Railway Industry Women (LRIW) – Room 134**
- **Locomotive Maintenance**



© Bob Hall, licence CC BY-SA 2.0  
Union Station, Indianapolis





## Officers Association (LMOA) – Room 130

### App

The website features a list of the exhibitors with their booth numbers, which are helpfully colour-coded (red, green, blue) to make it very easy for visitors to find their way around.

In addition Railway Interchange 2017 has a very neat little app to help you find your way around. You can search exhibitors alphabetically or by category and you can star those of particular interest to you. You can then use the 'map it' function to see exactly where a particular exhibitor is located and you can use this with a 'locate me' function (by entering a nearby booth number) so that you can see where you are in relation to the booth you're looking for.

There is a diary function where you can keep track of meetings you have scheduled for the show and a note function, allowing you to jot

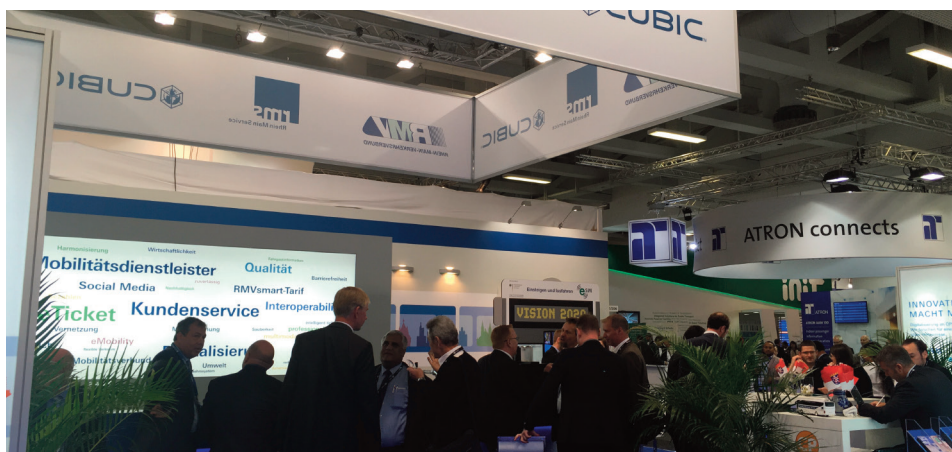
down important information while being able to see what supplier it relates to. Finally there is a simple 'visited' button you can tick to help you organise your day.

The full AREMA and CMAs schedule is also available on the app. Each event is listed with a time and location and has the useful diary, 'map it' and notes features mentioned above. The app allows users to search events by speakers. Many of them have already provided headshots, making it

easier to recognize and spot them on the day. There is a separate list of just the keynote speakers for a useful overview of that segment.

The app includes a full set of maps of the halls and the entire exhibition centre so you won't feel lost, hopefully!

To round the whole thing off you'll be able to access information about things to do, dining and where to stay so that you'll have a well organized, stress-free Railway Interchange 2017!







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# Featured Exhibitors at Railway Interchange 2017

**Contributor                      Booth Number      Exhibit Hall**

<b>Baultar Mechanical Solutions Inc.</b>	2959	RSI
<b>Bender, Inc.</b>	2409	RSSI
<b>Frauscher Sensortechnik GmbH</b>	1801	RSSI
<b>International Electronic Machines</b>	3181	RSI
<b>Miner Enterprises, Inc.</b>	2939	RSI
<b>Next Generation Rail Technologies</b>	2010	RSSI
<b>Parker Hannifin</b>	3481	RSI
<b>Plasser American Corporation</b>	4453	REMSA
<b>PowerRail</b>	3445	RSI
<b>Schenck Process</b>	2169	RSI
<b>Schlatter Industries AG</b>	3576	REMSA
<b>Thales Transport &amp; Security, Inc.</b>	2110	RSSI
<b>Times Microwave Systems</b>	2417	RSSI
<b>Trimble Railway Solutions</b>	2573	RSI
<b>Zetica Rail</b>	3587	REMSA







# **RAIL SAFETY WEEK 2017**

**25th September - 1st October**

**Is your  
safety  
on point?**

**#buildingsafetytogether**



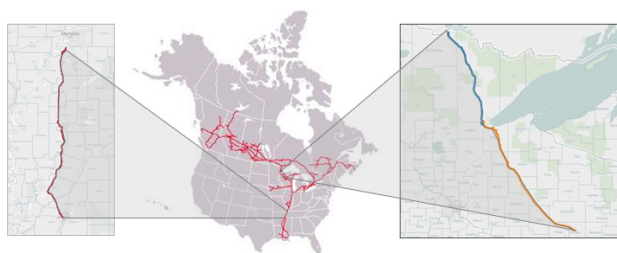
# INSPECTION TECHNOLOGIES FOR TRACK MAINTENANCE PLANNING ON THE CANADIAN NATIONAL

## MAKING MAINTENANCE PLANNING MORE EFFICIENT

Historically railroads have taken a reactive or preventative approach to trackbed maintenance with work undertaken on a fixed schedule or following failure. New inspection technologies provide the opportunity to move to condition-based and ultimately predictive approaches, which offer the potential to reduce costs and maximize maintenance efficiency – the so called LEAN approach.

Between 2015 & 2016 the Canadian National (CN) commissioned Zetica Rail & Balfour Beatty Rail to undertake integrated track inspection surveys of over 590 miles of track on three sub-divisions (Figure 1).

The primary aim of these surveys was to provide data for use in planning the company's capital maintenance activities (undercutting, shoulder cleaning) and to create a database of potential sub-surface defects (such as ballast pockets) which could be referenced as and when a track defect was reported.



**Figure 1:** Locations of the 2015 & 2016 RASC surveys on the CN network

The surveys were undertaken using a Railway Asset Scanning Car system, or RASC®, mounted on a Ford F250 hy-rail vehicle (Figure 2). The RASC® concept involves integrated data capture of a suite of complementary track inspection technologies that together allow a comprehensive assessment of both the above and below ground condition of the trackbed.

Three key systems were deployed: high and low frequency ground penetrating radar (GPR) to inspect the trackbed condition and map the sub-surface layers, a linescan camera system to capture images of the surface of the ballast and a high-speed 2D profiling laser to capture images of the trackbed, trackside assets and the surrounding terrain. The surveys were carried out at

speeds of up to 20mph, although the technologies themselves are fully capable of data capture at speeds in excess of 100mph when deployed from a suitable platform (inspection train, in-service train).

The acquired datasets were located using a combination of on-board Inertial Navigation System and differential GPS. As well as augmenting the GPS information the INS provided the necessary attitude data (roll, pitch and yaw) required to fully process the laser data.



**Figure 2:** RASC® solution deployed from hy-rail vehicle on the CN network.

Processing of the data streams was carried out using Zetica Rail's bespoke data processing software with the outputs from the three inspection systems reported as a series of trackbed condition metrics, designed to provide an easy means of quantifying the dense and often complex datasets.

The list of metrics generated for the CN survey is detailed in Figure 3. The majority of the metrics are reported over a standardised minimum granularity (typically 5m or 15ft) in order to enable the combination of individual metrics for planning purposes.

### Surface Condition Metrics

- Total Ballast Volume
- Ballast Excess/Deficit
- Ballast Profile Conformance
- Super-elevation & unloaded gage
- Surface Mudspot Index
- Track Drainage Index
- Advanced Track Drainage Index

### Sub-Surface Condition Metrics

- Ballast Fouling Index
- Free-Draining Layer Index
- Ballast Thickness Index
- Layer (Interface) Roughness Index
- Layer Complexity Index
- Moisture Likelihood Index
- Ballast Pocket Index

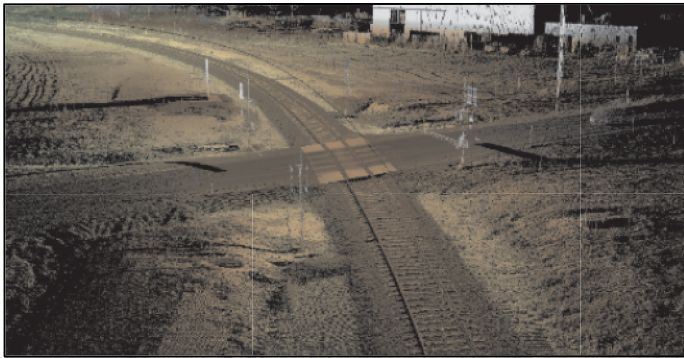
**Figure 3:** List of surface and sub-surface condition metrics obtained from the RASC® surveys.

In addition to the metrics the surveys also generated detailed geo-referenced 3D point clouds (Figure 4) that could be used for asset mapping and clearance analysis.





# INSPECTION TECHNOLOGIES FOR TRACK MAINTENANCE PLANNING ON THE CANADIAN NATIONAL

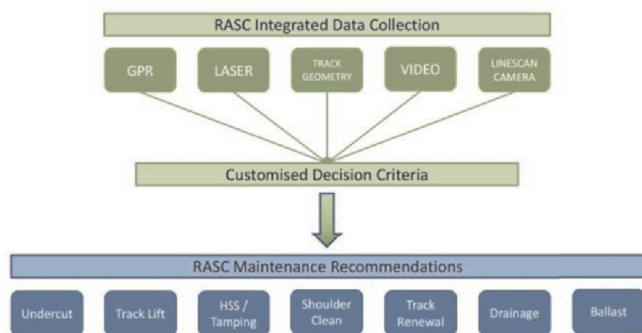


**Figure 4:** Example of 3D point cloud derived from the 2D laser profiling survey

## Maintenance Planning

Identification of areas of trackbed requiring specific maintenance activities was carried out using a combination of maintenance planning tools including the Combined Trackbed Quality Index (CTQI) and Work Order Recommendations (WORs). The CTQI aims to classify the condition of the trackbed based on a weighted average of selected trackbed condition metrics. This approach is similar to the concept of a Surface Quality Index (SQI) used in the analysis of track geometry data.

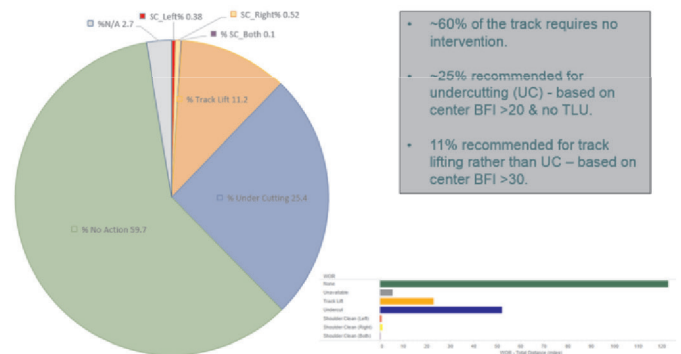
The WOR approach goes a step further in assessing the most appropriate type of maintenance activity for any particular section of track using a rules-based approach. The rules are specific to each particular maintenance type and can be customised as required based on the client's requirements (Figure 5).



**Figure 5:** The RASC® work order recommendations approach

WORs were generated for three maintenance types: undercutting, track lifting and shoulder cleaning. The results for one of the sub-divisions are summarised in Figure 6. For each sub-division data clustering was applied to the 15ft results in

order to identify minimum-length work packages. Clusters were terminated at the location of fixed assets, such as bridge decks, over which maintenance could not be undertaken.

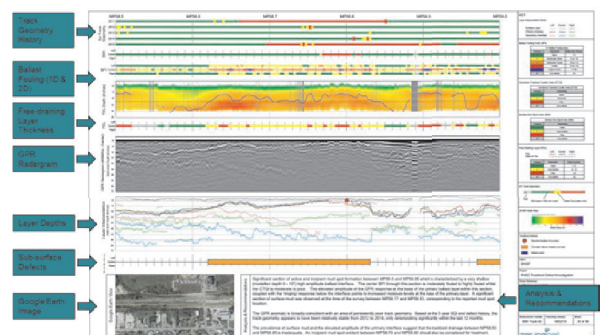


**Figure 6:** Example of WOR results

## Geotechnical Information

The integrated RASC® datasets also provide information to inform follow-up geotechnical investigations and plan remedial works. Information on suspected trackbed defects such as ballast pockets and incipient mud spots was collated to provide the CN with a database of locations for follow-up investigation.

Where a more comprehensive analysis of suspected problem locations is required, Zetica provides detailed trackbed inspection reports (TBIRs). TBIRs integrate the outputs from the RASC® survey with other track inspection results such as track geometry, with the objective of highlighting the nature and extent of any tracked defects.




**Figure 7:** Trackbed inspection reports



# What is the Place for Rail in Tomorrow's Global Freight?

The Paris Climate Agreement was signed in April 2016 by 195 countries that account for 99.75% of the global emission of greenhouse gases. *By Yves Perret, DB Engineering & Consulting GmbH*



© David Brossard, licence CC BY-SA 2.0  
BNSF freight train crossing over itself on the  
Tehachapi Loop, California



They all committed to plan and report contributions in order to mitigate global warming. Prior to this historical agreement China announced in 2013 its ambition to develop a New Silk Road, (The Belt and Road Initiative), featuring the development of 5 different land corridors to Europe via Central Asia, Russia and the Middle East, investing massively in infrastructure along the route and subsidising massively industries ready to use these new logistics paths. In reaction to this geopolitical and commercial assault by its big neighbour, India has decided in parallel to develop a Silk Road of its own, the North-South Transport Corridor (NSTC), linking India to Russia via Iran and Central Asia. This 7,200km multimodal trade corridor would support the growth of major emerging economies and challenge Chinese hegemony on the Eurasian continent.

The most optimistic players in the logistics industry see in these various multibillion investment projects the opportunity for rail to be eventually truly supported and

funded by governments, institutions and big players from the private sector, while others remain more cautious, well aware of the gap that exists between plans and the business reality. It has been indeed noticed over the years, particularly in Europe, that despite encouraging initiatives from the political sphere to favour rail over road, that rail share remained until today very steady in the European modal split. The signature "white paper 2011" by the European Union, targeting to shift 50% of freight journeys from road to rail by 2050, is a good example of this non-alignment between eloquent public institutions and the economical decision-makers. Likewise President Trump's recent decision to withdraw from the Paris Agreement and his general defiance towards global trade agreements is not pleading for massive investment in the railroads network, even though rail already plays an important part in the American modal split.

Nevertheless these ambitious infrastructure investments have

already started and several Middle Eastern and Central Asian countries are on their way to modernise their ageing railway systems thanks to the expertise of Western Europe. Supply chain operators from the old continent, such as Deutsche Bahn or the Belgian Lineas have already strengthened their eastbound connectivity by running containers by rail from their northern ports and logistics hubs to China. In order to fully benefit from this new trade landscape, Europe should probably reconsider its strategy toward rail and make sure to be able to offer modern infrastructure and logistics solutions to carry the massive amounts of goods that will knock at the doors of its borders in the coming years. What if the real trigger to encourage rail solutions over roads in Europe were to come from the emerging countries? What if rail could become the favoured mode in tomorrow's global freight?







## 1) In Western countries the rail share has remained very steady over the past few years

The last report by the European Court of Auditors released in 2016 and logically entitled "Rail Freight Transport in the EU: Still Not on the Right Track" gives a good overview of the difficulties faced by the rail industry in Europe over

the past few years and presents a total share fluctuating only between 17% and 20% since 2000 in the inland modal split (against 75% for roads). Despite the objectives of the Commission to shift 30% of freight transported by road over distances greater than 300km to other modes of transport by 2030 and the allocation of €28 billion funds by the EU to rail projects between 2007 and 2013, rail has lost competitions to roads for several reasons:

- The performance of rail freight transport in the EU is still disappointing and has failed to respond to the competitiveness and flexibility of road solutions, which remains the favoured mode across industries

- The poor financial performance of the railway operators does not lead to a satisfactory level of investment necessary to renew and modernise their rolling stock

- The lack of co-operation between infrastructure managers and the poor interoperability of the rail networks have led to poor performance in terms of average commercial speed as well as punctuality

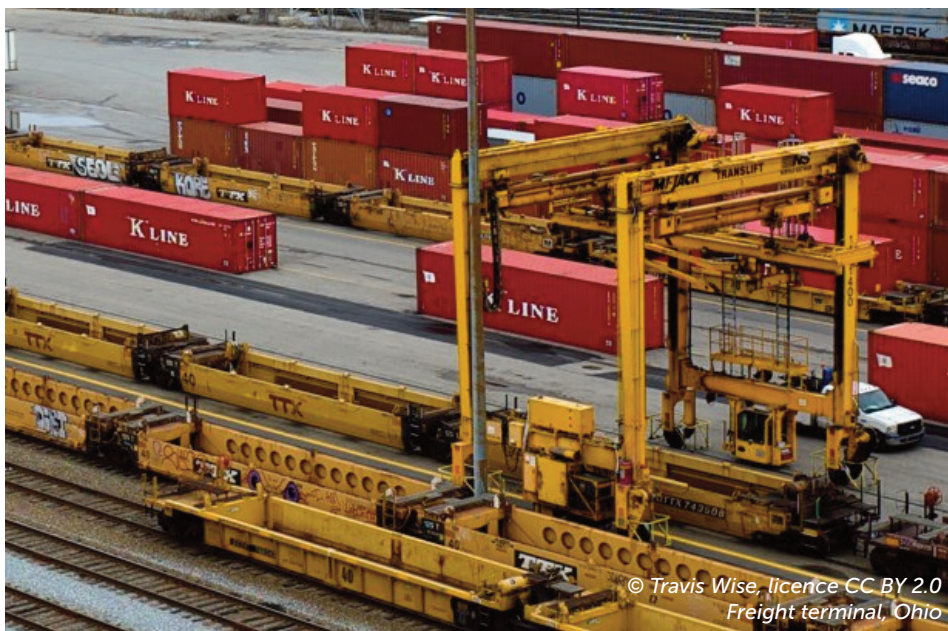
- Different national regulations around safety, paths allocation and traffic management procedures have not contributed to the establishment of a Single European Railway Area

- Positive externalities, such as environmental impacts or accidents, are not taken into account in the prices paid by the infrastructure users efficiently enough

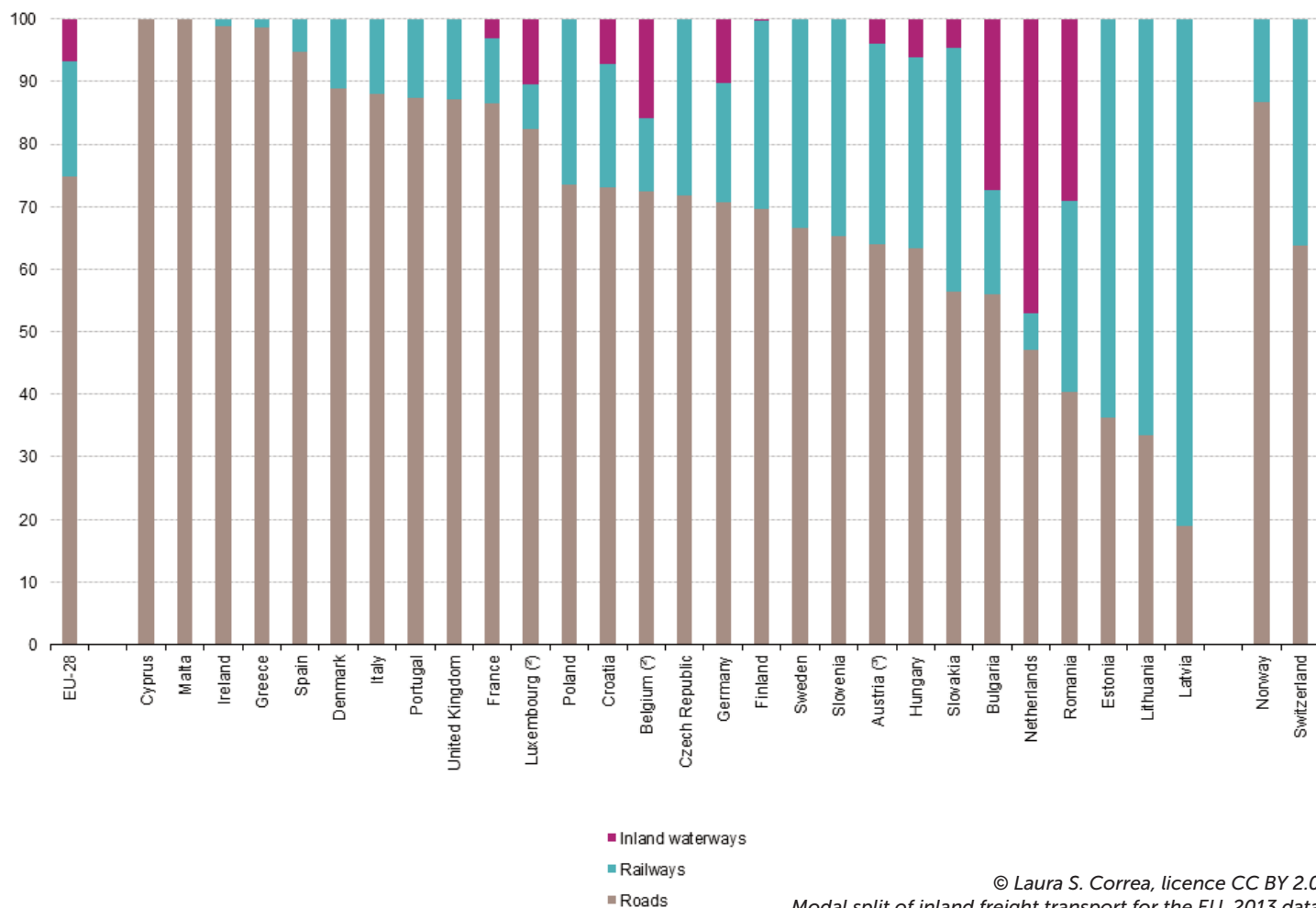
- EU funds allocated to rail projects are not often used to support the growth of the freight sector

- Rail networks need to be modernised and adequately maintained in order to avoid speed restrictions and construction works

To reverse this trend, the European Union should consider standardising its legislation across







© Laura S. Correa, licence CC BY 2.0  
 Modal split of inland freight transport for the EU, 2013 data

(\*) Excluding pipelines. Cyprus and Malta: railways not applicable.

(\*) Estimates.

(\*) The railway in Liechtenstein is owned and operated by the Austrian ÖBB and included in their statistics.

Source: Eurostat (online data codes: rail\_go\_typeall, iww\_go\_atygo, road\_go\_ta\_tott and road\_go\_ca\_c) and Eurostat calculations.

Member States and softening administrative constraints around rail freight, to make it a truly competitive mode against road.

In the USA, the situation is different thanks to the geography of the country with long straight distances allowing 2000-metre freight trains and double-stacked containers to travel over long distances, which makes rail profitable over road. The rail share oscillates between 25% and 30% of the total modal split. Despite a strong comeback in recent years, due to the rise of diesel prices, rail share has slightly declined over



© Miroslav Volek, licence CC BY 2.0  
 BNSF freight train, Browning, Montana



the past three years, seeing coal transport declining in particular. This trend has led in the previous days to the announcement of job cuts for one of the major American railway operators, Union Pacific.

Low diesel prices combined with the medium-term threat that size and weight limits of trucks could change, allowing them to be longer and heavier, are not playing in favour of the rail industry. The relocation of several manufacturing industries to Mexico, as a result of multiple free trade agreements, are hurting domestic rail activities. Intermodal traffic, representing an important part of the business, is also impacted by the strategy of the big e-commerce actors that are developing faster networks between their warehouses and distribution centres to respond to their customers' expectations to receive their deliveries as soon as possible. No current major rail projects concern freight as priority is rather given by several states to the modernisation of existing local rail networks for commuters and to investment in high-speed rail networks, such as the California

High-speed Rail Project. In order to survive, the nature of rail freight in the USA must change to offer higher-frequency mixed trains ensuring a more reliable service and responding to the current supply chain challenges, such as the reverse logistics of the e-commerce sector.

## 2) The two giant Asian economies and Middle Eastern countries are massively investing in rail infrastructure

In order to face an industrial overcapacity especially in the steel and heavy goods industry and to address a domestic market that is slowing down, China has injected nearly one trillion dollars in its New Silk Road. According to its own estimations, China hopes to lift a value of \$2.5 trillion cross-border trade within 10 years. In order to financially support the investments necessary to modernise the infrastructure located in the countries alongside the different historical routes of

the Silk Road, China has created a \$40 billion Silk Road Fund for projects in Central Asia, a \$50 billion Asian Infrastructure Investment Bank (AIIB) and a \$10bn BRICS-led New Development Bank. An important part of these funds will be of course allocated to the rail infrastructure, where many technical and legal challenges must be taken up. Two gauge changes along the route, different national safety regulations and complex customs clearance processes require a certain expertise and intelligent co-operation and co-ordination between all stakeholders involved. To make this solution attractive to the private sector, it needs to be accompanied by modern information technology and a high level of digitalization. Nevertheless the average speed of 17 days from China to Europe gives rail the competitive advantage over maritime solutions and big players from the automotive and textile industries are already using this land bridge, while regularly shipping their containers on distances over 12,000 km. China's ultimate goal is to make this New Silk Road a free trade corridor.

To stamp out the infinite appetite of China and reduce its leadership in Eurasia, India is investing massively on the other major logistics project of this young century, the North-South Transport Corridor (NSTC). Initiated as early as 2000, this project aims to connect the Indian Ocean and Persian Gulf to the Caspian Sea, linking emerging countries, such as India, Russia and Iran. Current solutions to transport goods between India and Russia require a 45-day journey by ship via the Arabian Sea, the Suez Canal, the Mediterranean Sea, North Sea, and



the Baltic. This new corridor would result in a 30% cheaper price and a 40% shorter lead time. India also estimates that the volume of \$1.6 billion in exports to Russia is extremely low given the size of these economies.

Located at the crossroads of these two trade corridors, Iran logically benefits from the ambitious plans of these two giants. Following the removal of the nuclear sanctions European, Russian and Chinese experts are supporting Iran in expanding the size of its railway network from 15,000km to 25,000km by 2025. \$25 billion worth of rail infrastructure projects have been identified by Iranian railway officials, including the double-tracking and electrification of the existing network. Various projects to support growing freight volumes are currently under construction in order to better connect Iran with its immediate neighbours. One of the key connections with Turkmenistan that will facilitate the flow of oil and grain between the Central Asian countries and Iran, will be upgraded by the Russian Railway RZD. Pursuing their strategy of rebuilding the Silk Road, China is also financing the electrification of the 1000km route between Tehran and Mashhad (Iran) to increase the freight capacity of 10 million tonnes per year, connecting the 2 hubs in 6 hours, instead of 12 today. On the other end of the Silk Road, The Iran-Europe corridor is also promising and several railroads are currently under study, via Azerbaijan and Russia, via Georgia and the Black Sea and a third one through Turkey. The potential to ship automobile parts from Europe to Iran and petrochemicals or textiles in the opposite direction makes rail an attractive mode for industry

players, who are looking to reduce their lead-time to the Persian Gulf.

From a more global perspective, the former Central Asian Soviet republics as well as Pakistan are all seeing either Chinese or Indian money being invested to expand and modernise their railway infrastructure.

Not far from Iran, another region of the world, the Gulf Cooperation Council composed of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates intends to sign a Memorandum of Understanding with the European Union, to link the different rail networks and create a single railway area for passengers and freight in the region. The project was originally scheduled to be completed by 2018, but has been finally pushed back to 2021, due to a lack of alignment and delays in several countries' programmes necessary to enable this connection. This \$250 billion project would allow the region to relieve the congestion of its road network, reduce energy costs by 60 to 80% compared to road and therefore bring about freight cost savings. Moreover the number of accidents as well as air pollution will decrease. This project will make the manufacturing sector of these countries more competitive on the global market.

Israel has also recently announced its goal to double the size of its rail network to reach 2572km by 2040 and develop connections to its neighbouring countries. This project will not only concern passenger movements but also significantly grow freight volumes from 104 to 224 daily trains, tripling the tonnage from 53,000 to 143,000 tonnes. The number of terminals will be increased from 19 to 32.

*"While in the past, government policy was anti-rail and consequently the railways were short of money, nowadays the government is pushing us ahead and Minister of Transportation wants more and more tracks,"* said ISR General Manager Shahar Ayalon. Israel is also studying junctions to Lebanon, to Jordan via the Sheikh Hussein crossing and from Ashkelon to the Gaza Strip. The Minister of Transportation, Yisrael Katz, announced that the opening of the Israeli rail network could *"only contribute to the peace and stability of the region"*.

### 3) These projects are positioning rail as a key mode of tomorrow's global freight, making Europe review its global transport strategy

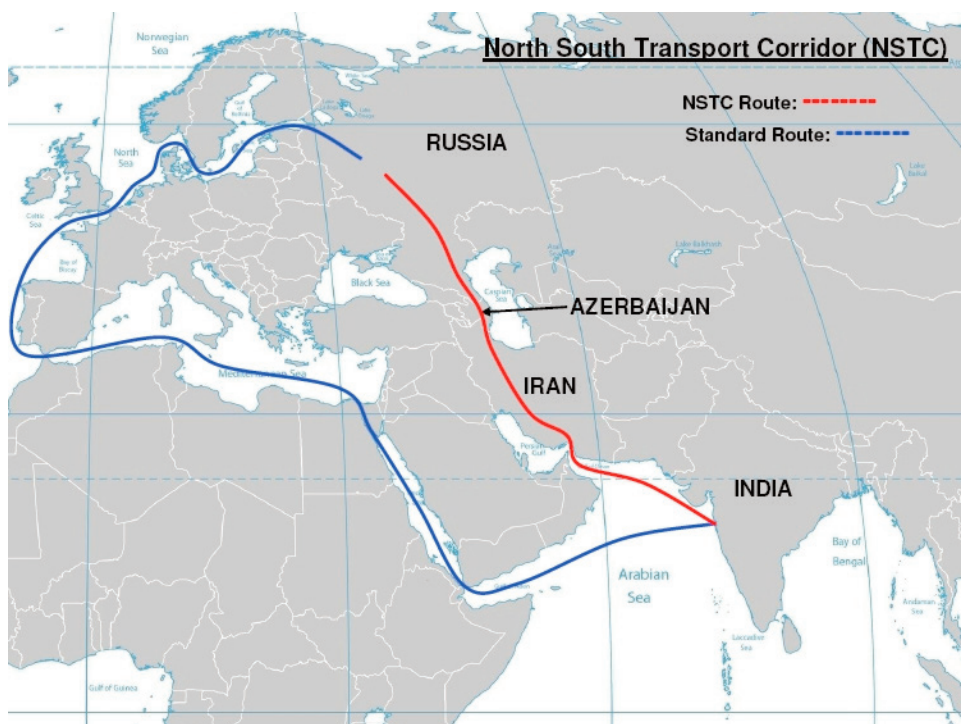
All the historical European railway undertakings and engineering companies are taking advantage of these many and various projects since developing countries are looking to acquire the knowledge required to design sustainable infrastructure and operate passenger and freight trains. With the presence of the Italians from Ferrovie dello Stato working on a \$1.2 billion project to electrify the first high-speed line between Qom and Araq, the French from Arep (SNCF Group) renovating three major stations as well as the Germans from Siemens and DB Engineering & Consulting (Deutsche Bahn Group) supporting various infrastructure and operations projects, Iran has become a country of

opportunities for Europe to sell its competences. The money invested in railway systems by these booming economies will eventually encourage Europe to accelerate the renovation of its own network in order to increase its capacity and run the growing trade volumes coming from Asia and the Middle East. Despite a disappointing average modal split of around 18% in the European Union (in tonne-kilometres) over the 5 past years, positive signs give hope to the rail operators. The environmental challenges mainly due to road congestion are causing decision-makers to find alternative transport solutions. That's why the European Parliament voted, between 2001 and 2016, four different railway packages in order to create a Single European Railway Area, supporting international rail transport by standardising regulations and safety policy, working on the networks' interoperability, opening markets to competition, ensuring price transparency and fair competition between operators. The European Union is also offering a range of subsidies to encourage the private sector to use rail logistics solutions over road. The amount of money committed by several countries to rail infrastructure is a sign that this mode is not neglected. Germany decided in 2014 to invest €28 billion in the renovation of its network, including tracks, bridges and signalling systems, by 2019. This represents the largest investment in the history of Deutsche Bahn. Moreover DB Cargo, its freight operator, has announced a €1 billion investment over the next five years to extend its rolling stock fleet and accelerate its digitalisation. Two other tiny and mountainous countries in Europe are also

proving that rail transport is not only designed to cover straight long distances without geographical constraints. Austria and Switzerland are the countries with the largest modal split in favour of rail, with a share of around 35%. The former transported around 22 billion net tonnes by rail in 2014, ranking it 4th in Europe in terms of tonne-kilometres, behind Germany, France and Poland. This good performance is indeed not only due to transit, but also single wagons and intermodal transport. Austria invested €2 billion, in 2016 alone, in the extension of its network. The same goes for Switzerland with the opening of the €10 billion Gotthard Base Tunnel in 2016, facilitating rail transit through the Alps, increasing then rail freight volumes on the German-Italian corridor. From a more global perspective, the containerisation of global freight is an opportunity for rail to grow its market share in Europe and ensure the coverage of the

long land stretches for volumes coming from or going to the ports. Intermodal is a key growth area for rail but it requires the extension and construction of new terminals in order to offer door-to-door solutions to customers.

If rail wants to become tomorrow's first choice logistics solution on these new international corridors, long-established and newer operators will have to offer a high and stable quality of service, move towards more digitalisation to reduce operating costs and respond to the market demand of real-time information and tailored solutions, as well as standardised legal and safety regulations. To fulfil these requirements, the full support of the institutional investors and a strong co-operation between countries to offer modern, safe and interoperable networks along international routes, will be required. Rail could then become the 21st century transport mode for global freight.



*By Zbk1, Public Domain  
North-South Transport Corridor*



**NGRT S.L. is a Spanish registered company focusing on railway safety.**

With substantial knowledge of the railway industry, Next Generation Rail Technologies (NGRT) aim to take the leading role in connecting our clients to the right supplier pending on the specific requirements from our clients as well as delivering state-of-the-art NGRT products, all based on new novel technologies.

## Railway Applications

- Train Detection
- Broken Rail Detection
- Derailment Detection System
- Worksite Protection
- Flood and Wash-out Detection
- Flat Wheel Detection
- Rolling Stock Weighing
- Rockslide and Avalanche Detection

## System Components

### Main Assembly

- Runs up to 3 NGRT applications simultaneously
- 1 x Power Unit, 1 x I/O Unit, 8 x Control Units
- 1 x Information & Diagnostics Unit
- Flexible and expandable architecture
- Low power consumption
- Built-in redundancy and GSM connection
- Industrialised 19" 3U size
- NGRT certified enclosure or existing REB



### Contact information

Next Generation Rail Technologies S.L.  
Phone : +34 952 768 465  
info@ngrt.org, www.ngrt.org

## Broken Rail



Identifies location of incident

Infrastructure surveillance

Linked to Central Control Centre

## Rockslide and Avalanche



Detects any objects falling onto the rail

Detections units typically 5 km apart

Infrastructure surveillance

Combined with other NGRT applications



# SRS Road-Rail Vehicles: Unbeatable mobility on the tracks



The constant increase in passenger and freight rail traffic increases wear on materials and machines. The result is a higher maintenance requirement and shorter intervals before more work is necessary.





*Excellent performance!- SRS road-rail vehicles impress with their safety, traction, road-rail transfer speed, braking ability, speed and comfort*

The limited availability of track therefore means the work has to be performed more efficiently to minimise railway traffic disturbance. As the costs of using conventional rail-bound machines and working methods to carry out this work are continually increasing, the future belongs to flexible road-rail systems.

SRS road-rail vehicles move between work sites at normal road speed and can be driven on the road as close as possible to the work site. This reduces the track transport time considerably and increases the effective working time on the track. A further decisive advantage of road-rail vehicles is that they can be loaded at the depot and are therefore able to transport materials to the work site using the road and the track. The easy and uncomplicated transfer of the vehicle from the road on to the track saves time and money as

there is no need to reload the material. This means that road-rail vehicles can usually work longer at the site.

The patented road-rail system equipped with a hydrostatic drive eliminates contact between the rubber tires and the rails. When the vehicle is on the track it rests entirely on the rail wheels. This avoids wear on the rubber tires, which helps cut costs. The quick transfer of our vehicles from the road to the track requires just three to five metres of a level crossing. In comparison to conventional systems, the advantages in terms of time-saving and lower costs of the SRS rail driving system are clear to see. Designed to handle speeds of up to 100 km/h on the track the SRS road-rail system is incredibly safe within its speed range compared to systems which use tires. The rail wheels of our system give our vehicles the same characteristics

as a purely rail-bound vehicle on the track including the same braking capacity and traction.

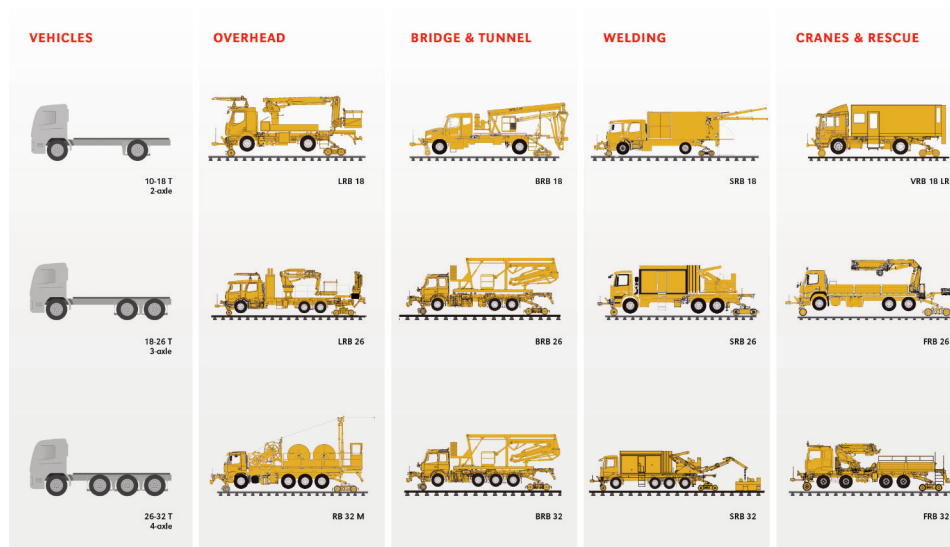
The SRS system also allows the remote control of the vehicle from, for example, the working platform or the crane. During this time, no driver is required in the cab. This reduces costs and saves time and also eliminates the risk of a misunderstanding between the driver and the operator. The mechanised vehicles are equipped with an electronic control system, which further reduces the number of operators and therefore also the operating costs.

All SRS vehicles are custom-made to meet customer needs and specifications. They comply with the European standard for road-rail vehicles EN 15746/RIS1530 for both mainline and light rail.

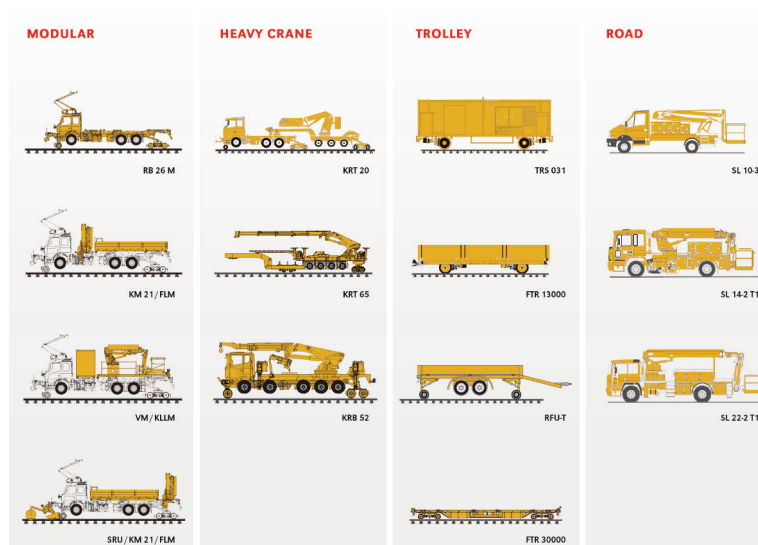
## Your Benefits

- » **Patented road-rail system equipped with a hydrostatic drive**
- » **Rapid transport to and from the work site**
- » **Speed of up to 100 km/h on track (forward & reverse) and up to 90 km/h on the road**
- » **The rail system requires only 3 to 5 m of a level crossing to transfer from the road to the track**
- » **Fast and safe driving on and off the track in less than 2 minutes**
- » **No risk of derailment at crossing points, wing rails and level crossings**
- » **No special speed restriction requirements for curves, switches and at level crossings**
- » **Remote control of the vehicle**
- » **All vehicles are custom-made to meet customer needs and specifications**
- » **All vehicles comply with EN 15746/RIS1530**
- » **The SRS service team ensures reliable operations and a long life for your vehicles**

## Standard Product Range



## Special Vehicles



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MEMBER OF  **GOLDSCHMIDT**  
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# Preventing Suicides on the Rail Network

Suicides are always a tragedy. They are a visible sign that services failed in reaching the individuals in questions early enough, before they opted for this heart-breaking decision.

*By Josephine Cordero Sapién*

They are a source of great loss and distress to family and loved ones left behind.

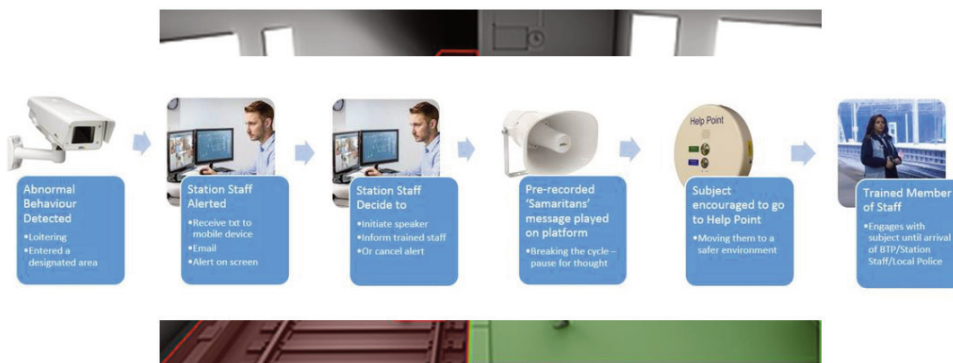
In 2015–16 there were 278 suicides or suspected suicides on

the rail network according to the ORR (252 on mainline, 26 on the London Underground). A further 38 fatalities suffered by members of the public (i.e. not passengers

or members of the workforce) were non-suicide fatalities. In 2014–15 the number of suicides or suspected suicides on the rail network was 308, the highest



## Suicide Prevention in Rail



www.axis.com



annual figure since at least 2002. Of all the fatalities on the rail network, suicides make up by far the largest percentage.

In the same year, 2015–16 there were 357 injuries to members of the public on the rail network, of which 94 were attempted (suspected) suicides. All 23 of these injuries that occurred on the London Underground were due to attempted suicides or suspected suicides. These figures are all in the ORR's 'Rail Safety Statistics' for 2015–16. New figures will be released in September 2017.

In addition to the tragedy of suicide to the individuals concerned and their loved ones as stated above, on the rail network there are wider implications. Train drivers, for example, experience incredible trauma when an individual commits suicide in front of their train. They feel responsible for what's happened and they feel guilty, having been unable to stop the train in time. The event takes place right in front of their eyes, causing the horrific images to be etched into their minds. And it's not just train drivers. It's the members of the British Transport Police, it's platform staff, cleaning staff and passengers on platforms or other members of the public,

maybe even children, who witness the event.

Furthermore of course there are the more practical costs. A suicide on the rail network will lead to delays and to financial costs to the operators and the government. Obviously this latter point is much less significant than the human cost; however, the railways are about human stories – maybe you're on your way to your best friend's wedding or to a reunion or to your grandmother's funeral. Maybe you're on your way to a date or an exciting job interview or to see your sister's new baby for the first time. The point is, the railways are where life happens and it is surely the most uncontroversial of statements to say that suicides on the rail network should absolutely be prevented.

Lucas Young from Axis Communications has written a white paper entitled 'How network video can support suicide prevention on the rail network'. He believes that video analytics could form an effective component in suicide prevention. The idea is that CCTV cameras on platforms could identify certain behaviours that might be linked with someone considering suicide and that this

could then trigger an intervention response before it's too late. I spoke with him to talk a bit more about his idea.

My first question was two-fold: if you prevent a suicide thanks to platform video analytics, won't the individual in question simply attempt suicide again elsewhere, including elsewhere on the rail network? Or, if such preventive measures are in place on platforms, won't individuals simply choose a different spot from the get-go, such as at a level crossing? (There were 12 level crossing suicides in 2015–16, see ORR report.)

Regarding this latter point, he said that of course it was impossible to hermetically seal off the entire rail network, but cameras mounted on the front of trains could potentially spot at risk behaviour by people on bridges for example.

Regarding my former question, he told me that there was a 'thirty-minute window' during which the individual contemplating suicide has the strongest urge. This wave passes after that time; indeed, suicides are often very impulsive acts so it's vital to intervene during that critical window, when the person is most at risk. Some say that most people who attempt suicide change their mind. However, the Tennessee Suicide Prevention Network say that "80% of people who die from suicide have made at least one previous attempt".

Though that figure is sadly high, even preventing some suicides by intervening in time is a good thing. And of course, once at risk individuals have been identified, they can be given access to the support services they need so that they can move away from a place



where suicide seems the only option to them.

This led me to my next question. Wasn't investment in suicide prevention at this point too late? Shouldn't money instead go into mental health services so that individuals never even reached such a dark place as to contemplate and move forward with attempting suicide?

This was really a rhetorical question because the answer to that is very clearly: yes! Absolutely! Mental health services in England are woefully underfunded and in crisis. In fact it was reported that 'thousands of mentally ill patients have been forced to travel hundreds of miles for treatment' and that 'mental illness affect[s] around a quarter of the UK population' (in: New Statesman, The UK's mental health care is in crisis – the next government must act urgently).

As a side note, apart from it being outrageous that you would have to travel so far for treatment, this situation is actively putting these vulnerable individuals into contact with the rail network (as a potential mode of transport), where they could impulsively act on suicidal thoughts.

To this Lucas Young said that although this was ideally the case, he of course at Axis had no influence over that, nor in fact did Network Rail so they had to act with the circumstances as they found them. We can all do our bit. This is his bit.

Using video analytics to identify at risk individuals is a huge technical challenge, from what constitutes at risk behaviour – e.g. loitering close to where the trains enter platforms, as most successful suicides occur in the first third of a platform where trains are going

## Suicide Prevention in Rail



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fastest – to capturing images of sufficiently high quality for analysis.

However, the system could look something like this: smart cameras detect abnormal behaviour, which in turn causes station staff to be alerted. After that the station staff could initiate a loudspeaker message, by the Samaritans for example, or inform a nearby trained member of staff. Before the member of staff arrives the individual could be encouraged to move to a help point, thereby moving them away from the platform edge and to a safer location. The trained staff member would then engage with the individual until the arrival of the British Transport Police.

Lucas Young's white paper goes more into the technical details of how such a system would work and I recommend that you read it. However, that's beyond the scope of what I wanted to say here.

Of course, such a video analytics system isn't the answer on its own. Only one third of suicide attempts take place on station property. And here too other measures would be complementary. Platform screen doors of course prevent access to the tracks before the train has

come to a halt. Barriers could be set up in the first third of the platform, preventing access where trains are fastest. Alternatively, trains could be made to slow down to non-lethal speeds prior to entering a station. Lucas Young also noted that blue LED lighting had been found to have a calming effect as data from Japan suggested it had reduced the suicide rate by 84% at 71 stations.

These features are of course all very important. However, it is a deeply human problem and the right services need to be in place for all of us so we don't develop mental health problems, or so we can access the right support services beforehand. Network Rail's contribution here is to have well-trained staff who can spot and sensitively deal with at risk individuals. In addition, Train Operating Companies must nurture a culture where the trauma and depression train drivers feel can be openly addressed. The rail industry is at the front line here. A suicide on its network can easily throw staff into a state of depression, leading to an on-going cycle of mental health problems. The railways are about human stories. Let them be about weddings and reunions, not about suicide.

# IT'S WHAT'S inside THAT COUNTS

A closer look into the most trusted components in the industry.

From the outside, railcar parts may look the same. But to truly understand what goes into designing, refining and supporting the top-performing railcar components worldwide, let's take a look inside at the people, process, and commitment to performance that are the heart of every Miner product.

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40 years ago, a game-changing innovation was uncovered: Miner TecsPak® technology. Almost overnight, its unique elastomer design doubled (and in many cases tripled) product life expectancies and provided a superior solution to all-steel, rubber and urethane products.

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Since its introduction, TecsPak has been put to the test across continents and in thousands of hard-working applications. Our decades of experience give us a unique understanding of how to make railcars perform better, longer. That legacy lives inside every TecsPak-equipped component we manufacture, and it shows in their unsurpassed performance.

## Total quality that comes from complete manufacturing control.

Today, we still make every TecsPak-equipped draft gear and side bearing in-house. There is no better and more experienced manufacturing team than our own, and our total management of the production process promises consistent quality that meets or exceeds the high expectations of our customers.

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As the demands of the railcar industry continue to evolve, Miner continues to innovate and drive improvements in performance and longevity. Our dedicated product development teams work with our customers to determine the needs and are inspired by their desire to exceed limitations as we work to continually improve the ways we can be an indispensable partner in long-term performance.

## TecsPak-equipped draft gears and side bearings.

The core of our top-performing components is TecsPak technology. Invented by us decades







ago and continuously improved ever since, our TecsPak-equipped product line sets the industry standard for global excellence and reliability.

### Proven draft gear performance.

As a pioneer and industry leader in draft gear design, Miner has over 115 years' experience and has produced over 5 million units operating in a wide variety of services worldwide. Our TF-880™ TecsPak friction draft gear is the lightest weight high-performance option, allowing extra payload capacity and greater car design flexibility. With its patented elastomer compression spring package and proven friction clutch design, TF-880 absorbs more energy and can significantly reduce the transfer of damaging forces to your railcar. With a 37 year track record and over 1.4 million units in service, the TF-880 is the most specified draft gear in the industry.

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Miner draft gears have consistently demonstrated that their superior capacity actually increases over time, even in the most punishing service applications. In fact, our draft gears are known to perform as good as or better

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Miner TecsPak Constant Contact Side Bearings help minimize railcar life cycle costs by providing exceptional, proven control over the railcar truck instability known as truck hunting. Manufactured with the tightest tolerances in the industry, our side bearings are able to maximize energy absorption, allowing railcars to operate at high speeds while substantially reducing truck and wheel wear to extend service life and drive down maintenance costs.

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In everything that we do and in every product we make, you'll find a company-wide commitment to providing outstanding value and customer-focused innovation. We see ourselves as dedicated partners in driving performance and productivity for your rail fleet. Now that you've been able to look inside what goes into every Miner product, we hope you'll see it that way, too.

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# Upcoming Railway Events

## September, October, November 2017

### HSR Asia 2017

**12 Sep 2017 – 13 Sep 2017**

**Location:** Kuala Lumpur, Malaysia

HSR Asia 2017 is the definitive high-speed rail event for the industry's leading players who are currently tackling the strategic, technical and operational challenges of designing and implementing high-speed rail networks. This essential forum is targeted at those interested not only in the latest developments in the high-speed rail arena but also in the policies and regulations that both push and hinder the continued creation and operation of world class high speed rail systems.

**Event website:** <http://www.stratcoms.com/HSRAsia2017/>

### Railway Interchange 2017

**17 Sep 2017 – 20 Sep 2017**

**Location:** Indiana Convention Center

Railway Interchange is the largest combined railway exhibition and technical conference in North America. Attended by nearly 10,000 industry professionals from around the globe, this truly massive event showcases the latest technologies, services, and research by members of the Railway Supply Institute (RSI), the Railway Engineering-Maintenance Suppliers Association (REMSA), and Railway Systems Suppliers, Inc. (RSSI).

**Event website:** <http://railwayinterchange.org/>

### Fire Protection and Safety in Tunnels 2017

**19 Sep 2017 – 21 Sep 2017**

**Location:** Bergen, Norway, (Venue TBC)

Fire Protection and Safety in Tunnels is the leading event bringing together tunnel owners and operators, researchers, solution providers and fire safety experts to gather and share best practices, risk minimisation strategies and technological advances which protect tunnel infrastructure and passenger safety across the continent.

**Event website:** <http://www.arena-international.com/fpst>

### 4th Annual UK Rail Industry Forum 2017

**20 Sep 2017**

**Location:** Addleshaw Goddard, Milton Gate, 60 Chiswell St, EC1Y 4AG

The 4th Annual UK Rail Industry Forum will be taking place on 20 September 2017 in London. This important gathering of senior professionals in the UK rail industry will meet to discuss and debate the most pivotal issues facing the current rail network and hear innovative solutions to concerns including capacity and connectivity. Join 120+ of the industry's most important rail industry leaders from TOCs, FOCs, construction and transport consultants, who will join to hear the latest

insights on new models of delivery and technology, set to both change and benefit how our railways are run. Receive 10% off when registering using code – 334RNEWS

**Event website:** <http://bit.ly/2tpkauW>

### Rail Safety Week 2017

**25 Sep 2017 – 01 Oct 2017**

**Location:** UK, TBC.

Rail Safety Week is an industry-led initiative focusing on rail safety for all. Whether your career lies within the rail industry, or whether you use the railways to get from A to B – rail safety affects us all. Rail Safety Week aims to address, engage, promote and bring rail safety to the forefront of people's minds across a dedicated week. Working in partnership with leading names in the rail industry, health and safety conferences, site briefs and school safety-based events will be held across the UK in order to promote the vital importance of rail safety to each and every one of us.

**Event website:** <http://railsafetyweek.info/>

### 4th Wheel Detection Forum

**04 Oct 2017 – 06 Oct 2017**

**Location:** Austria Trend Hotel Park Royal Palace, Vienna, Austria

Under the motto "The future of train tracking", the fourth incarnation of the Wheel Detection Forum will be packed with presentations, discussions and reports on proven as well as future technologies.

About 250 leading experts are awaited to join the forum in Vienna.

Thereby this will also be the perfect opportunity for networking with senior decision makers from all over the globe.

**Event website:** <http://www.wheeldetectionforum.com/en/home/>

### APTA EXPO

**09 Oct 2017 – 11 Oct 2017**

**Location:** 285 Andrew Young International Blvd NW, Atlanta, GA 30313

Held just once every three years, APTA EXPO is the nation's largest showcase of technology, products, and services related to the public transportation industry. With more than 800 exhibitors and 15,000+ industry peers, APTA EXPO is the foremost event where innovation and technology converge to determine the future of every entity of public transit. At APTA EXPO you can expect to network with industry leaders and experts from around the world, get hands-on time with emerging technologies, and learn about how these innovations can accelerate every aspect of your organization. Registration is free to the public and includes unlimited access to the expansive show floor as well as free educational sessions in the Learning Zones on a wide variety of vital topics. Register now for free!

**Event website:** <http://www.aptaexpo.com>

## Nordic Rail 2017

10 Oct 2017 – 12 Oct 2017

**Location:** Elmia, Elmiavägen 15, 554 54 Jönköping, Sweden

Nordic Rail is the only dedicated railway exhibition in Scandinavia. It's a fair for companies, organisations and individuals with a professional interest in the railway, directly or indirectly. Nordic Rail is the industry's most important meeting place for customers, representatives and other stakeholders. Here at Elmia Nordic Rail you can hear the latest news, share experiences and build transnational networks.

**Event website:** <http://www.elmia.se/en/nordicrail/>

## African Rail Evolution

17 Oct 2017 – 18 Oct 2017

**Location:** Durban International Convention Centre, Durban, South Africa

African Rail Evolution is the only African forum for maintenance and rehabilitation professionals that features best practices and pioneering case studies on maintaining, upgrading and future-proofing ageing rolling stock, track, signalling, OHTE electrical and cabling, equipment and/or infrastructure. This is a niche event for rail maintenance and rehabilitation engineering professionals that will look at future rail systems and the impact of digitalisation and big data on maintenance and railway safety. Leading rail operators will also present case examples and debate how best to manage maintenance and rehabilitation to preserve their rail infrastructure and rolling stock in the future. The event will be attended by representatives from government, rail operators, large industry, i.e. mining and manufacturing, international organisations and the private sector.

**Event website:** <http://rail-evolution.com/>

## SmartMetro 2017

06 Nov 2017 – 08 Nov 2017

**Location:** TBC

SmartMetro is the perfect platform for engaging with global metro operators on how technology can solve the key issues affecting the urban transport today; from signalling and safety to the digital passenger. SmartMetro work closely with the transport industry to deliver in-depth technical and operational content via innovative event formats to foster networking & the exchange of information and ideas.

**Event website:** <http://www.smartmetro.eu>

## Transrail Connection 2017

08 Nov 2017 – 09 Nov 2017

**Location:** Cité de la Mode & du Design, 34 Quai d'Austerlitz, 75013, Paris

TRANSRAIL CONNECTION, became over the years, the international meeting place for the railway and urban mobility industry, which gathers numerous national and international main actors of the sector. This event allows suppliers of technology, who master a know-how linked to railway devices, and contractors, European and global manufacturers and subcontractors, who research innovative and technologic solutions, to come together in the same place at the same time. For this 5th edition, more than 500 participants from around the world will meet and to discuss with customers, prospects and/or providers. Each participant will be able to attend the round table, organized by Ville, Rail & Transports, focused on "Automatic undergrounds around the world?" and various conferences, on 3 main issues: the digitalization, innovations & technologies transfers and urban mobility.

**Event website:** <http://www.transrail-connection.com/home>

## Railway Interiors Expo 2017

14 Nov 2017 – 15 Nov 2017

**Location:** Prague Letnany Exhibition Centre (PVA), Beranových 667, Praha 9 - Letnany, Prague, Czech Republic

Railway Interiors Expo is the international showcase of everything within a railcar, from seating and materials, lighting, washroom facilities and flooring to composites, infotainment systems and security concepts. Railway Interiors Expo regularly attracts far in excess of 2,000 attendees from all over the world – it is a truly global networking opportunity.

**Event website:** <http://www.railwayinteriors-expo.com/index.php>

## World Rail Festival 2017

14 Nov 2017 – 15 Nov 2017

**Location:** Mövenpick Hotel Amsterdam City Centre, Amsterdam, The Netherlands

The World Rail Festival 2017 will be in its 7th year and it continues to grow and attract a large audience of rail operators from around the world. The conference will host hundreds of attendees, 100 speakers and 40 exhibition booths. Over 100 different global rail operators will be represented at this event.

**Event website:** <https://goo.gl/Bf6573>

## AusRAIL PLUS 2017

21 Nov 2017 – 23 Nov 2017

**Location:** Brisbane Convention & Exhibition Centre, Australia

AusRAIL PLUS is the largest rail event in Australasia, attracting close to 7,000 attendees. The event comprises of a 3-day conference which includes technical streams, keynote ministerial addresses, CEO forums and more, run alongside a large scale exhibition of 450 exhibition stands. The theme for this year's conference is: Rail's Digital Revolution.

**Event website:**

[http://www.ausrail.com/?utm\\_source=Media\\_Partner&utm\\_medium=email&utm\\_content=Rail\\_News&utm\\_campaign=P17M01](http://www.ausrail.com/?utm_source=Media_Partner&utm_medium=email&utm_content=Rail_News&utm_campaign=P17M01)

## 2nd Annual Rolling Stock Procurement Forum

21 Nov 2017

**Location:** Addleshaw Goddard, Milton Gate, 60 Chiswell St, EC1Y 4AG, UK

The Rolling Stock Procurement Forum is a focused guide on establishing the long-term requirements for new rolling stock in the UK, and on all aspects of the procurement process. Through case studies, expert advice, and project updates explore all factors that impact on the delivery of new fleets, from financing and understanding the viability of fleet life extension, to developing maintenance plans, upgrading infrastructure and future proofing for new technology and infrastructure developments. Receive 10% off when registering using code – 338RNEWS

**Event website:** <http://bit.ly/2uHZH4H>



# Schlatter Industries AG, leading in rail welding technology for more than 100 Years

## Focus on customer benefits

Schlatter is market leader in stationary rail welding machines for long welded rail production (LWR) and for welding machines for turnout parts, frog points and crossings. Also the mobile rail welding systems are worldwide well known and widely used for welding continuous welded rails for high speed tracks and heavy haul tracks.

In Schlatter rail welding machines the focus is on quality. This comprises both: Quality, long life time and low operation costs of the machines but also quality of the final rail welds.

For good quality welds, Schlatter developed the designated Schlatter Weld Processor (SWEP) which controls the main parameters „current“, „force“ and „travel“ and their correctly timed interaction.

These three parameters are constantly supervised by the new Schlatter Weld Analyzer which records every weld. Setting tolerance fields allows deciding if the parameters are in the desired range immediately after the welding process.

### Mobile rail welding machines and systems

Schlatter offers various mobile rail welding systems for in-track welding of continuous welded rails (CWR). The latest development produces closure welded tracks without separate pulling devices for destressing. Customers choose between three different mobile rail welding machines: Supraflex type AMS200, AMS100 and AMS60. All these mobile welders offer the same

high welding quality but different rail end aligning systems. AMS200 and AMS60 aligns on the running edge, left or right side selectable, and is most suitable for high speed railway tracks for passenger transportation. AMS100 aligns the centre of the web and is mainly designed for heavy haul and conventional railway tracks.

The AMS200 has an autarkical deburring system, which allows to deburr the whole rail profile automatically directly after welding, even both rail end are in clamped position. Our AMS100



*Schlatter's renowned GAAS80.  
The stationary rail welding machine that  
guarantees for highest welding quality.*



and AMS60 rail welding machines have also an incorporated deburring system which deburrs automatically directly after welding around the complete rail profile.

Two alternative rail welding systems are available: Supra roadflex, the truck based system for road / rail operation with very high flexibility. Supra multiflex, consisting of standardized containers which can be mounted onto flat waggons or can be used semi stationary at the job site.

## Welding short rails into long welded rails with Schlatter GAAS80

The renowned Schlatter rail welding machine GAAS80 is worldwide in daily welding operation in rail welding factories. It features DC weld current, precise alignment of the rail ends (on running edge, selectable left or right side), precise vertical alignment including „crown-position“, outstanding weld quality and automatic deburring only

seconds after welding. The rail ends remain clamped during deburring which contributes to quality. Little remaining burr around the rail profile results in easy and cost effective grinding. For complete production lines, Schlatter cooperates with experienced partners for the additional machines like rail end brushing machines, straightening presses and rail profile grinding machines.

## Railway switches and crossings welded with Schlatter GAA100

The Schlatter GAA100 flash butt welding machine has an extremely compact housing, open at the front for easy loading and positioning of work pieces. Totally four clamping presses, each with 1000kN clamping force, make sure that there is no slip.

Railway turnout parts, points and crossings as well as switch blades are exposed to very high loads. For a long service life,

manufacturers use hard manganese and high alloy steel which is welded to conventional rail steel with the Schlatter GAA100. This requires complex weld programs and special processes.

Major manufacturers of turnouts and switch blades use the Schlatter GAA100 successfully for its flexibility, its high quality welds and for its geometrical accuracy.



*The strongest of Schlatter's rail welders type GAA100. Designed for to weld bi-metal pieces of railway switches and points.*

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**NEW**



## Rail Welding System AMS200 for closure welds and distressing

The AMS200 is the latest development in mobile rail welding machines, a new generation which enables the distressing and the flash butt welding process to be carried out in one operation, without an additional pulling device.



Visit us at REMSA 3576



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# The Future of Rail Surveying

## How high-accuracy drone surveys look set to change the way rail track data is captured

*By Malcolm Donald, Head of Rail at Plowman Craven*

With a highly-publicised commitment to creating a 'Digital Railway', the challenges facing Network Rail are considerable. With more than 20,000 miles of track and 40,000 structures, all of which require continual inspection, monitoring, renewal and maintenance, and a rail system already operating at 200% of planned capacity, the need for

accurate survey data that can be more easily integrated in to existing railway design workflows has never been greater.

But how to capture this information more quickly, with less disruption and in a much safer way? Traditional survey and inspection methods typically require track closures and

possessions to enable surveyors to manually measure and observe the entire track and the surrounding rail infrastructure. With enormous pressure on the rail network already and so many bottlenecks, the limitations of the current system are all too obvious. With surveys usually at the front of a project, any delays in accessing the tracks can bring the entire





undertaking to a grinding halt, leaving teams with nothing to work on. Once possession is actually achieved, sites often become hugely congested as surveyors operate alongside multiple companies carrying out maintenance works. The risks associated with working on tracks are significant – as are the financial costs of both the possessions and the resulting delays.

So, from Network Rail's perspective, the monumental challenge is how to safely balance the essential surveying and maintenance of the network with keeping passenger disruption to a bare minimum.

Drones – also known as Unmanned Aerial Vehicles or UAVs – would appear to be the obvious answer, but can they deliver the sub-5mm high-accuracy levels required by engineers and track design teams? Traditional 'boots on ballast' surveys certainly can, but it's a time-consuming and hazardous process. Aerial surveys are undoubtedly quicker, and are already conducted for certain projects (typically using helicopters or UAVs) but the data accuracy is somewhere in the region of 30–60mm.

Thanks to a collaboration between Network Rail and survey company Plowman Craven, a new system has been developed that offers the very best of both worlds. The Vogel R3D aerial survey system produces validated survey data to sub-4mm accuracy (with up to 2mm possible) – believed to be a world-first for drone-mounted rail surveying – without the need to access tracks. Network Rail's Senior Survey Engineer has described it as a "game-changer". Uniquely, the system is predicated

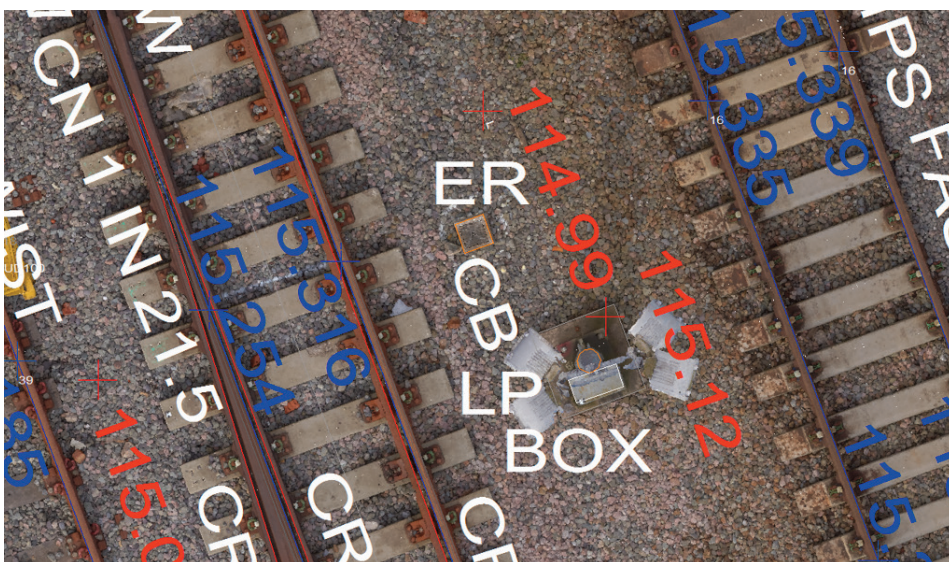


on the company's experience in photogrammetry, which involves extracting data from ultra high-resolution photography rather than laser scanners to generate a 3D point cloud (a point cloud being made up of billions of pixels correctly positioned in 3D space). The resulting point cloud can be analysed using specialist CAD software including Revit, AutoCAD or MicroStation, and from this it's possible to generate topographical surveys, track alignment data for p-way design and 3D BIM models, as well as range of other data sets.

With enhanced permissions and an 'Operation Safety Case' from the Civil Aviation Authority,

Plowman Craven's UAV team, for example, is able to fly at low levels, even over live railways. Operating at a height of 25m, the drone follows a series of pre-programmed flight paths to capture hundreds of overlapping high-resolution images using a 100-megapixel camera. Ground control targets in the cess are used to tie the photographs to the survey grid.

Using bespoke algorithms and special software these images are then combined and common pixels matched to produce a 3D point cloud – this is what's called photogrammetry. By taking both nadir and oblique images (looking straight down and at a 45-degree







angle) it's possible to capture every single visible surface to give a full picture of the entire site without the need to access the track.

The exciting thing about such a new system is the potential for enhanced deliverables, thanks to the capture of more and better data. Where traditional 'manual' surveys can provide raw data of the discrete points being measured, the Vogel R3D captures the entire site, meaning no return visits.

In addition to the vital topographical and track alignment information, the fact that both high-resolution imagery and high-accuracy, survey-grade data are being captured ensures a complete visual record with measurement data behind it.

The benefit of this to operators is significant. Not only can site visualisations, condition surveys and asset inspections be conducted, enabling stakeholders to 'walk' the site from anywhere in the world using a tablet or computer, but using a widely available software package such as Leica's TruView makes it possible to 'interrogate' the imagery and extract measurements.

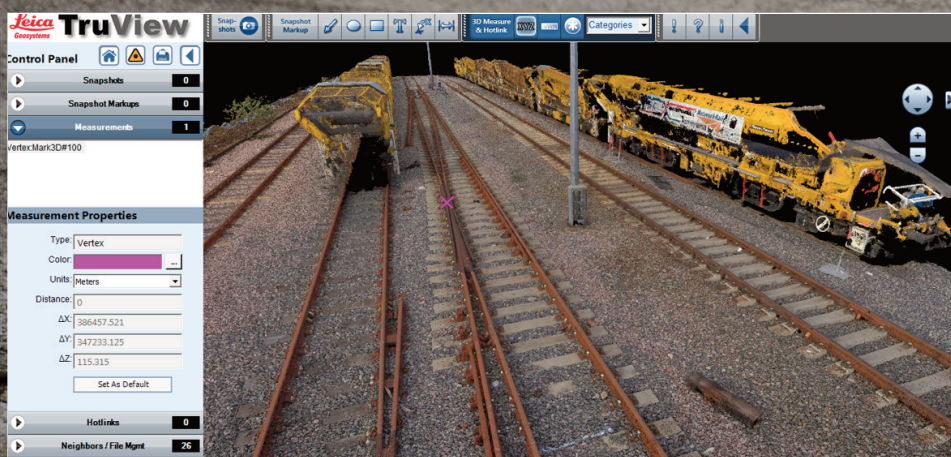
Users can identify certain areas, pull up exact measurements on screen and share with interested parties. For train operators with extremely limited information on the physical characteristics of their route, being able to access such usable, verified survey data could be hugely beneficial.

The raw photography is so precise

that it's possible to read the markings on the sleepers, identify specific rail clips and clearly view flash butt welds – simple things that are highly problematic for surveyors working on the tracks at night.

While many drone companies operating on the rail network are just that – and more used to supplying imagery and video – Plowman Craven's history of surveying everything from property, heritage and construction to rail, underground and even movie sets, has enabled the company to apply technical know-how to the problem. Having spent many years conducting track surveys for Network Rail, and recently created a world-first technical solution while working on Crossrail, Plowman Craven's rail team spent more than two years researching whether the drone surveying capability used in its property division – to survey buildings, rooftops and landscapes – could be applied to the rail environment. "Nobody thought it was possible and there seemed to be a general acceptance that UAV software was at the limit," says Tom Wren, who heads up Plowman Craven's rail team. "We always thought we could get the accuracy down to sub-10mm but getting below 5mm was the ultimate goal. We looked at every aspect of it from software, to hardware, to techniques. We questioned everything, looked for the weakest links and explored every possible avenue of our surveying knowledge. It was a massive investment, both financially and in terms of time, but it's been well worth it."

With strong support from Network Rail's Senior Engineer, Chris Preston, and the S&C South





Alliance Project Manager, Michael Alldis, regular presentations were made to the Network Rail Track Technical Board where enthusiasm for the project was unanimous.

By Spring 2017, following a live demonstration at Grange Sidings in Stoke-on-Trent, the system was approved by Chris Preston as able to produce Band 1 quality rail surveys ( $\pm 5\text{mm}$ ), having been extensively measured and validated against the Amberg track mounted GRP1000. In addition, the methodology has been through a CSM HAZID review with the support of the Network Rail's Survey Team and the Air Operations Team and is now being deployed on live jobs.

Chris Preston hailed the impact of the new system. "Vogel R3D is a real game-changer for Network Rail," he said. "It helps us to satisfy many of our survey requirements in a safe manner without the cost implication or potential programme delay associated with multiple possessions."

The challenge now is to apply the technology to other areas of the rail network. For example, infra-red or thermal imaging sensors on the drone would make it possible to monitor the temperature of assets, while laser sensors could be used to measure embankments covered in vegetation. With embankment slippage being a significant problem for Network Rail this could be highly beneficial given the current need for specialist rope access to conduct embankment surveys.

With so many potential applications and benefits, the use of drones really is changing the face of rail surveying.





# Keeping up with change in wireless communication

Egbert Stellinga, TE Connectivity's product manager for antennas, explains how train manufacturers and operators can keep up with the fast pace of change in wireless communication.

Rapid development of digital railway technology and growing customer expectations for mobile communication mean that wireless traffic is growing fast. This is presenting the railway industry with a major challenge.

Whereas trains are designed for a 30-year life, communication hardware such as radios, antennas and switches must be replaced every 5–7 years. Many train builders are already installing high-performance Category 7 cabling to support future upgrades. Shifting to higher-capacity, cellular networks will open up the potential to offer

more data services to passengers, as well as enable smoother operation through adoption of condition-monitoring systems. OEMs (original equipment manufacturers) and refitters must specify equipment such as antennas with care. While every application for antennas is different, the top priorities for rail antennas are compatibility with frequency bands (frequency range) and mechanical aspects of performance such as the air speed, IP (ingress protection) rating and DC (direct current) grounding.

## Frequency range and bands

A large frequency range and the number of frequency bands supported are important. A large range will ensure that an antenna will be compatible with the frequencies in multiple countries. The most commonly used frequency bands in rail are: cellular or LTE (Long-Term Evolution), WiFi or WLAN (wireless local area network), GPS (Global Positioning System) and the Tetra band, which is used by emergency services.



However, multiple antennas can be housed in one enclosure, meaning that a single unit can take the place of four. This saves time during installation and maintenance and can reduce the number of spares required. One benefit of this is that it minimises the number of holes in the train roof. Refitters can upgrade to a new antenna with a standard four-hole mechanical mounting that fits as a like-for-like replacement.

## Future-proofing data transmission

Like other industries, rail operators are shifting towards faster technology, such as fifth generation 5G cellular technology which will potentially be four times faster than today's 4G network when it is rolled out from 2020. Operators may need to install new antennas to accommodate 5G as it will probably use the 700MHz and 3.5GHz bands.

Looking ahead, the next big step in WiFi technology is the IEEE 802.11ax standard (AX). This will

introduce a new type of WLAN with maximum speed predicted to be 10 Gb/s, four times faster than the current technology. It achieves this by squeezing signals to get more data into the same bandwidth using MIMO (multiple-input and multiple-output) antennas.

Although AX won't be available until 2019 or later, it will be compatible with today's state-of-the-art antennas that operate in the 2.4–2.5 GHz frequency range and is likely to become the rail industry's standard for WiFi.

## Mechanical performance

Under the hood, railway antennas are very similar to those in consumer electronics and other industries. The main difference is that rail antennas can survive harsh conditions and meet high safety standards.

This is particularly true for units installed on the roof of high-speed rail cars, which are housed in weatherproof enclosures

shaped like a shark's fin. These cut through air to minimise aerodynamic resistance and withstand mechanical shocks and electrical surges, even in the extreme case of a catenary line falling on to the train roof.

Interior antennas and those for the exterior of metros and commuter trains are less streamlined and withstand lower air speeds although they must also be weatherproof. The same is true for stationary antennas in trackside installations.

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# Zonegreen develops smarter depot system



Sheffield-based Zonegreen has launched a new version of its flagship rail depot safety system, in response to increasing interest from clients across the globe.

Sheffield-based Zonegreen has launched a new version of its flagship rail depot safety system, in response to increasing interest from clients across the globe.

Zonegreen has unveiled the new generation SMART Depot

Personnel Protection System (DPPS™), following its first complete overhaul in 15 years.

Designed with export in mind, DPPS™ now uses intuitive functionality, based on a simple four-button controller and a

graphical interface that can be programmed in any language, accommodating characters and letters. Remote configuration and assistance also makes overseas installations simpler and more cost-effective.



A wealth of extra features has been added to this latest version of DPPS™, which has been under development for six years and cost many hundreds of thousands of pounds to bring to market. The system has always been the safest method of controlling train movements in depots, but it is now easier to use and even more efficient to run.

DPPS™ is specified in most modern maintenance facility designs in the UK and its reputation is growing quickly, having been installed in some of the largest and most sophisticated depots in the world.

It combines powered derailleurs, road end control panels, train detection equipment, warning signals and personal datakeys to protect staff and infrastructure; it is the most advanced, reliable and tested product of its type. In addition, DPPS™ can be interlocked with a depot's signalling system, removing the need for shunt signals and allowing more streamlined processes to be implemented.

The powered derailer used by DPPS™ is the only one approved by Network Rail at present. During its development, Zonegreen underwent a testing programme in its advanced research workshop that simulated five years of continuous use, to ensure total reliability. This cutting-edge, essential piece of equipment offers absolute safety to depot staff, preventing them from injury caused by moving trains.

The customer-centric focus of the next generation DPPS™ extends to its design, which is more ergonomic than its predecessor. A tactile membrane has been added to improve durability, along with high-quality electronic components that have increased



its reliability and reduced power consumption, delivering further cost savings.

By continuing to utilise distributed intelligent technologies, Zonegreen has also ensured that if an error is detected on one road, normal operation can continue throughout the rest of the depot. This minimises disruption to workshop activities and represents a significant step forward from traditional centralised control panels.

Off the shelf software is now used to run DPPS™, which means the system can still be configured to the unique layout of each facility, yet enables depots to benefit from years of development, mitigating the risk of errors and reducing the risk of bugs. It is also now easier for Zonegreen to share new features and updates with existing and future clients.

The datakeys used to operate DPPS™ have also undergone a facelift. Most notably, they have changed in appearance, whilst internally the electronic memory chips have been upgraded. Following feedback from depots about their standard processes, the key now allows for an

increased number of authorisation levels to be granted, improving encryption and security.

Christian Fletcher, Zonegreen's technical director, said: "We are very proud of the next generation DPPS™. In the 15 years since it was launched, we have come a long way in terms of the technology available to us and the capacity of our team. Throughout the research and development phase, we listened to the needs of clients at home and abroad and used their feedback to create a system that is now simpler to install, easier to operate and more efficient to run."

For further information about the firm's suite of depot safety systems, telephone **(0114) 230 0822**, email **info@zonegreen.co.uk** or visit **www.zonegreen.co.uk**



**zonegreen**  
safe working solutions



# Protecting your depot's most valuable assets



## Zonegreen's SMART DPPS™

Give your rail depot workforce the confidence to work safely & effectively.

Even with all of the expensive infrastructure and equipment present in modern railway depots, the most valuable element of any rail facility will always be its workforce.

Zonegreen's SMART Depot Personnel Protection System (DPPS™) protects workers by safely and efficiently controlling train movements within depots.

By far the market leader, Zonegreen's DPPS™ has an unrivalled reputation as the most



**zonegreen**  
safe working solutions

advanced, high-quality, reliable, proven and widely-installed product of its kind, with installations both across the UK and around the world. The company boasts unparalleled expertise and experience in depot protection systems and employs an array of highly-skilled specialist engineering staff. Zonegreen is also an experienced and trusted provider of depot interlocking solutions.





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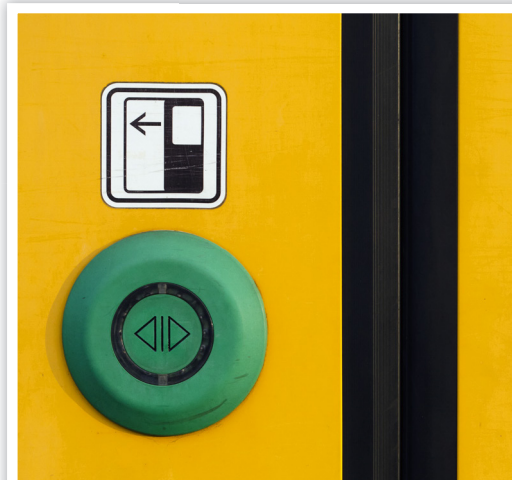
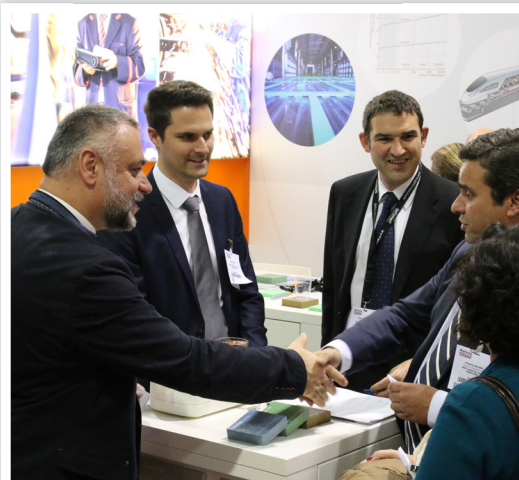
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